

Memorandum

TO: Performance Measures Technical Sub-Committee

FROM: John Crocker

DATE: April 11, 2007

SUBJECT: Regional Service Availability – Headways and Span of Service

This short report presents the availability of fixed route transit services within the metro Atlanta region during the period of early 2007 by focusing on two specific measures – Headways and Span of Service. The fixed route services are divided into four types – heavy rail, express bus, local bus and circulator since these routes have defined routes with (usually) some type of published headways and hours. The focus on these two standards is to complement some of the information presented in the SMARTRAQ report and the annual Metropolitan Atlanta Performance (MAP) report which highlight geographic coverage of the transit network through population and employment within walking distances of transit and overall vehicle service hours. Examination of headways and span of service allows an initial picture to be developed of the quality of the service that is being provided.

Services are described based upon the type of service being provided.

Local Bus

As of March, 2007, there were 140 local bus routes operating within the Atlanta region, nine (9) routes operated by CCT, four (4) routes operated by C-TRAN, five (5) routes operated by GCT, and the rest operated by MARTA.¹ Table 1 shows the number of routes operating at the various Span of Service LOS as defined by the Transit Capacity and Quality of Service Manual – 2nd Edition and Figure 1 presents the Local Bus Span of Service LOS.

¹ Because of their loop nature, MARTA routes 100 and 101 and C-TRAN route 500 were classified as circulator routes.

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Table 1 – Local Bus Span of Service LOS

	Weekday Span of Service		Saturday Span of service		Sunday Span of service	
A – 19-24 hours, Night service	65	46.4%	25	17.9%	6	4.3%
B – 17-18 hours, Late Evening Service	39	27.9%	58	41.4%	57	40.7%
C – 14-16 hours, Early Evening Service	25	17.9%	29	20.7%	31	22.1%
D – 12-13 hours, Day time Service	10	7.1%	11	7.9%	6	4.3%
E – 4-11 Hours, Peak hours only or limited Mid-day	1	0.7%	0	0.0%	0	0.0%
F – 0-3 Hours, Limited Service	0	0.0%	0	0.0%	0	0.0%
Total Routes in Service	140	0%	123	87.9%	100	71.4%
No Service	0	0%	17	12.1%	40	28.6%

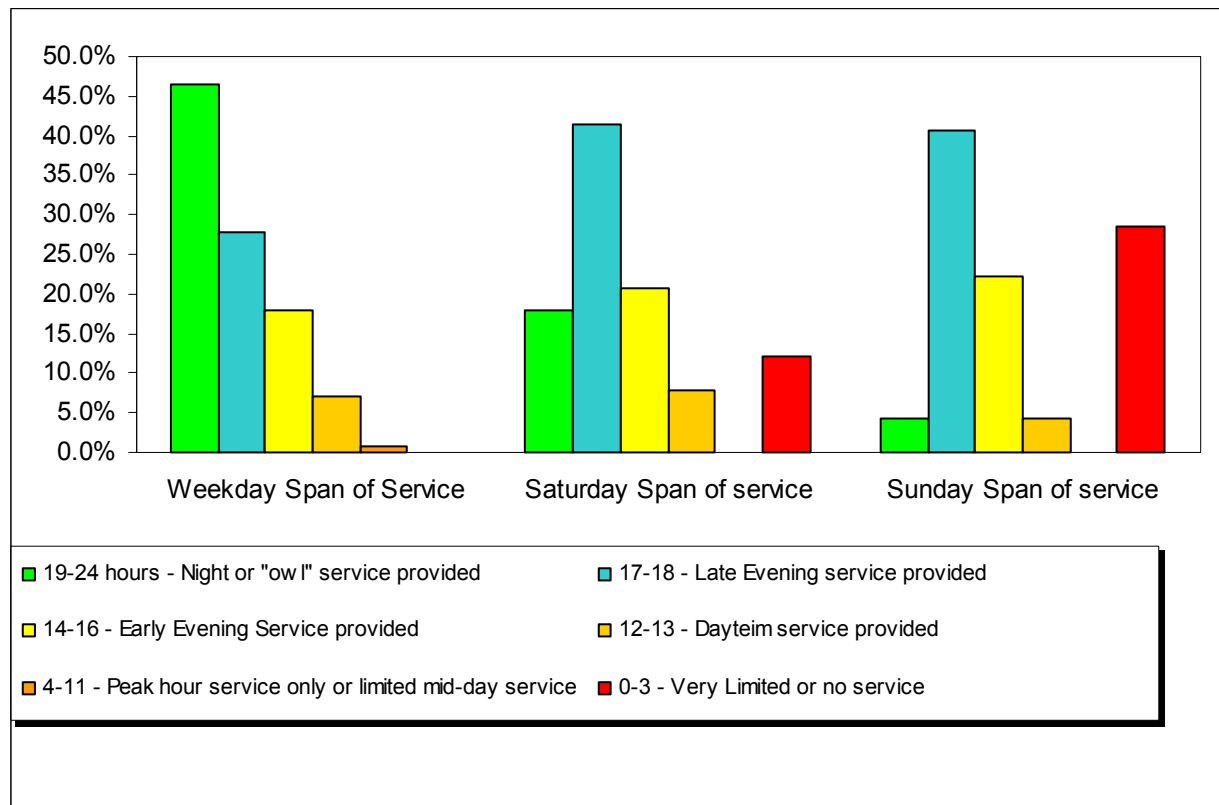


Figure 1 – Local Bus Span of Service LOS

Table 1 and Figure 1 show that most local bus routes in the region operate through at least the late evening of every weekday and Saturday, though over a quarter of all local service is not available on Sunday. In terms of the time of day that bus service is provided, Span of Service, our region is performing quite well. Table 2 presents the number of routes operating at the various LOS levels for headways and Figure 2 presents Local Bus Headway LOS.

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Table 2 – Local Bus Headway LOS

	Weekday						Sat		Sun	
	Peak		Base		Evening		Sat Freq		Sun Freq	
A – <10 minutes	1	0.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
B – 10-14 minutes	6	4.3%	0	0.0%	0	0.0%	1	0.7%	1	0.7%
C – 15-20 minutes	43	30.7%	12	8.6%	5	3.6%	6	4.3%	4	2.9%
D – 21-30 minutes	48	34.3%	70	50.0%	39	27.9%	31	22.1%	19	13.6%
E – 31-60 minutes	40	28.6%	46	32.9%	75	53.6%	78	55.7%	69	49.3%
F – >60 minutes	2	1.4%	7	5.0%	4	2.9%	7	5.0%	7	5.0%
Total Routes in Service	140	100.0%	135	96.4%	123	87.9%	123	87.9%	100	71.4%
Routes not in Service	0	0.0%	5	3.6%	17	12.1%	17	12.1%	40	28.6%

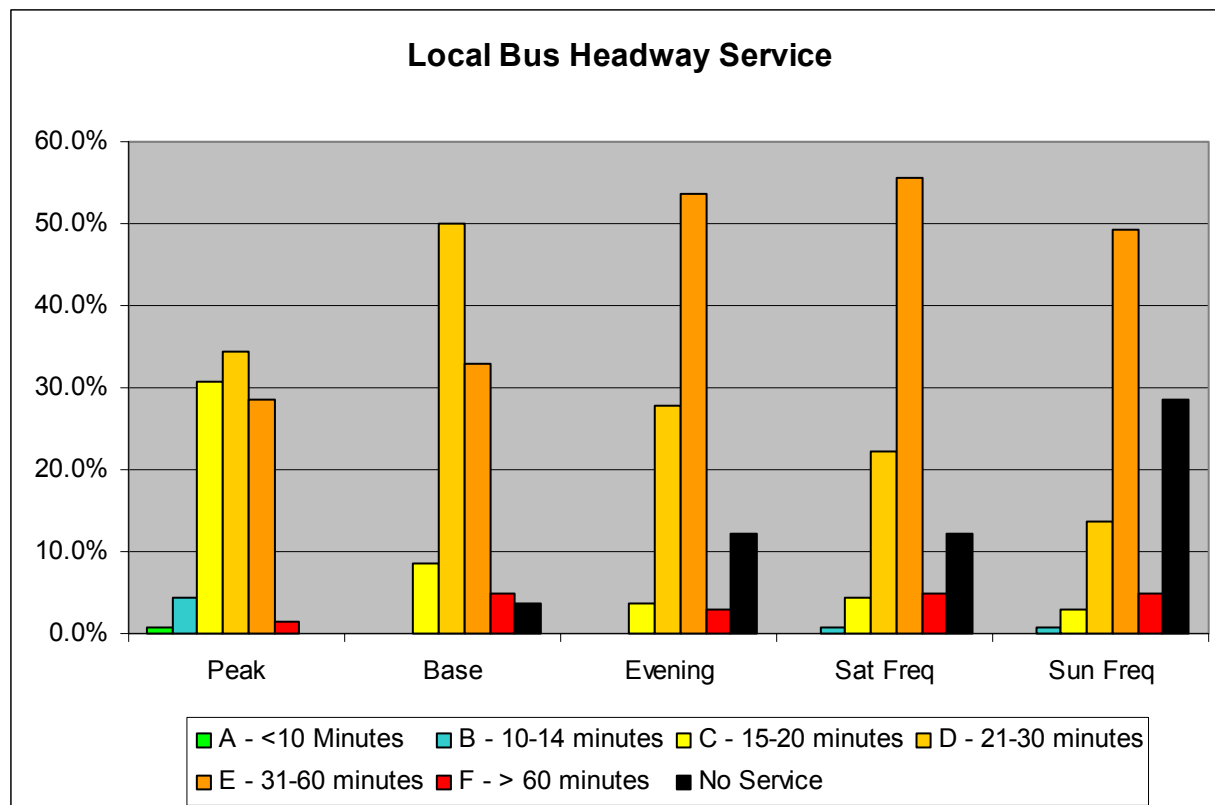


Figure 2 – Chart of Headway LOS for Local Bus Routes

Table 2 and Figure 2 show that only 5% of routes (7 routes total) in the entire regional local bus network even in the peak hour have headways of less than 15 minutes. No local bus route has headway of less than 15 minutes during the weekday off peak (mid-day and evenings) periods. In fact, figure 2 reveals that during the evening (after 8 PM) and on Saturdays and Sundays, over 50% of the local bus network operates at headways of greater than 30 minutes. In other words, there is only one bus per hour on these routes. In total, outside of the peak period, there is no time when more than twelve (12) routes out of total of one-hundred and forty (140) local bus

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routes, operate at headways of 20 minutes or less. For riders, this means that there are only twelve routes in the entire region where there are more than two buses per hour. According to the Transit Capacity and Quality of Service Manual – 2nd Edition at headways of greater than 20 minutes, bus service is unattractive to choice riders. This means that the Atlanta region's local bus network as currently structured is not attractive for any riders with other options.

In recognition that there are some roads along which multiple route travel, these shared segments were also examined to see if headways improved using multiple routes during the weekday time period. Indeed, this was the case for some segments. For example, along Peachtree Street between Arts Center and Lenox stations, there are two routes – 23 and 110 – each operating at 30-minute headways. However, they are schedules so that there is an effective 15-minute headway along that route segment meaning the actual Headway LOS is C rather than an LOS of D. Some additional locations where the actual LOS is higher than the individual route LOS because of multiple routes on the same stretch of roadway are:

- Lindbergh/Lavista Road between Piedmont and Cheshire Bridge
- Riverdale Road between Airport Station and Grant Park Boulevard
- Between the Marietta Transfer Center and North Marietta Parkway via Marietta Square
- Moreland Avenue between Seaboard Avenue and Glenwood Avenue
- Briarcliff Road between Clifton Road and Lavista

In total, out of all routing opportunities for headway reduction because of multiple routes sharing the same stretch of road, only 14 locations were identified with a reduction of headway in the peak hour.

This information raises some questions. First, are these headways for local bus routes appropriate for the region? If not, what are some ways to help improve the headways?

Express Bus

As of March, 2007, there were 33 express bus routes operating within the Atlanta region, nine (9) routes operated by CCT, eight (8) routes operated by GCT, five (5) Blue-Flyer routes operated by MARTA, and the final eleven (11) operated by GRTA.² Table 3 shows the number of routes operating at the various Span of Service and Peak and Off-Peak Headway LOS as defined by the Transit Capacity and Quality of Service Manual – 2nd Edition. None of these routes provide service on weekday evenings, Saturdays or Sundays.

² The 400 series routes operated under contract to CCT and GCT to GRTA are listed as operated by CCT and GCT.

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Table 3 – Express Bus Span of Service and Headway LOS

	Weekday Span of Service		Peak Hour Headway		Off-Peak Headway	
A – 19-24 hours, <10 minutes	0	0.0%	0	0.0%	0	0.0%
B – 17-18 hours, 10-14 minutes	0	0.0%	1	3.0%	0	0.0%
C – 14-16 hours, 15-20 minutes	7	21.2%	9	27.3%	0	0.0%
D – 12-13 hours, 21-30 minutes	13	39.4%	20	60.6%	0	0.0%
E – 4-11 Hours, 31-60 minutes	13	39.4%	3	9.1%	0	0.0%
F – 0-3 Hours, > 60 minutes	0	0.0%	0	0.0%	3	9.1%
Total Routes in Service	33	100.0%	33	100.0%	3	9.1%
No Service	0	0.0%	0	0.0%	30	90.9%

As expected, most routes provide only peak hour or peak hour and mid-day service.³ Additionally, most express buses are operating at headways of 30 minutes or less which are completely acceptable headways for express bus services. One route is even operating at headways of 10-minutes during the peak hour indicating significant express service demand from that location. Overall, the majority of express bus services seem to fall in ranges expected – peak hour services with 20-30 minute headways with some routes even operating at significantly shorter headways.

Circulator

Circulators were a little more difficult to examine than the fixed route local and express buses. Three local routes were classified as circulators primarily because of their loop nature and service of major activity centers – MARTA routes 100 and 101 which are branded as the Downtown and Midtown Tourist Loops respectively, and C-TRAN Route 500 which provides service around the Airport Loop road during the weekdays. An additional thirty (30) other circulators were examined for span of service and headway information including the routes operated by Emory, Georgia Tech, and Georgia State, BATMA, City of Canton and the Atlantic Station Shuttle. This examination yielded some interesting services ranging from activity center distributors, shuttles to MARTA rail stations, to some P&R shuttles reflecting a wide range of uses for circulators to meet the needs of their areas.

Tables 4 and 5 present circulator Span of Service and Headway LOS respectively.

³ The Transit Capacity and Quality of Service Manual 2nd Edition defines Span of Service for express bus services as hours the bus operates, with service counted as being provided in the mid-day if riders can take a local bus route back to their origin even if the express route itself is not operating.

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Table 4 – Circulator Span of Service LOS

	Weekday Span of Service		Saturday Span of service		Sunday Span of service	
A – 19-24 hours, Night service	4	11.1%	1	2.8%	1	2.8%
B – 17-18 hours, Late Evening Service	5	13.9%	0	0.0%	0	0.0%
C – 14-16 hours, Early Evening Service	6	16.7%	1	2.8%	1	2.8%
D – 12-13 hours, Day time Service	4	11.1%	2	5.6%	0	0.0%
E – 4-11 Hours, Peak hours only or limited Mid-day	11	30.6%	4	11.1%	5	13.9%
F – 0-3 Hours, Limited Service	0	0.0%	1	2.8%	0	0.0%
Total Routes in Service	30	83.3%	9	25.0%	7	19.4%
No Service	3	8.3%	24	66.7%	26	72.2%

Table 5 – Circulator Headway LOS⁴

	Weekday						Sat		Sun	
	Peak		Base		Evening		Sat Freq		Sun Freq	
A – <10 minutes	8	22.2%	7	19.4%	2	5.6%	0	0.0%	0	0.0%
B – 10-14 minutes	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
C – 15-20 minutes	8	22.2%	8	22.2%	10	27.8%	3	8.3%	2	5.6%
D – 21-30 minutes	6	16.7%	6	16.7%	1	2.8%	3	8.3%	3	8.3%
E – 31-60 minutes	6	16.7%	2	5.6%	2	5.6%	0	0.0%	1	2.8%
F – >60 minutes	1	2.8%	1	2.8%	0	0.0%	0	0.0%	0	0.0%
Total Routes in Service	29	80.6%	24	66.7%	15	41.7%	6	16.7%	6	16.7%
Routes not in Service	4	11.1%	9	25.0%	18	50.0%	27	75.0%	27	75.0%

Like the fixed routed system, the circulator network is most robust during weekdays, though the circulators do not appear to operate for as long as the local bus routes. An interesting feature of the headways is how frequently many of the circulators operate during the majority of the weekday with at least seven routes operating at less than 10 minute headways until the evening. Examining these routes shows them to be all routes operated by Emory, Georgia Tech, or Georgia State. Overall, circulators in the Atlanta region operate most frequently during weekdays with most of those operating having at least two or more trips per hour.

Rail

As of March, 2007 there are four rail lines operating on the heavy rail system in Atlanta:

- North Line – Airport to North Springs
- Northeast Line – Airport to Doraville
- East-West Line – H.E. Holmes to Indian Creek
- Proctor Creek Line – Bankhead to Candler Park/Edgewood

⁴ Note – Headway information was not available for certain shuttles. Therefore, the percentages do not add up to 100%. Information will be updated as it becomes available.

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There are also two shared segments. The trunk between Airport and Lindbergh Center is shared by the North and Northeast lines and the trunk between Ashby and Candler Park/Edgewood is shared by the East-West and Proctor Creek lines. All of these routes provide a Span of Service LOS A operating over 20 hours every day and, with the exception of the Proctor Creek Line, over 21 hours every weekday. During the peak hours, these routes operate at 10 minute headways provide LOS B on their branches and LOS A on their shared segments. Mid-day the routes operate at 15-minute headways (LOS C) with 7.5 minutes (LOS A) on their shared trunks. In the evenings LOS C is provided along the entire system since the North and Proctor Creek lines are limited to serving only their specific branches with transfers required to travel further on the system. Weekends, the line East-West and Proctor Creek lines provide 15-minute (LOS C) service with a 7.5 minute (LOS A) headways on the shared segment while the North and Northeast lines provide 20-minute (LOS C) headways with a 10 minute (LOS B) headway on the shared segment.

Summary

Overall, the Atlanta region has a regional transit network that operates for much of the day on routes that are running. Local bus routes generally run for much of the day, though a quarter do not operate on Sundays and frequency is usually only once an hour. The express bus routes provide weekday peak hour services primarily on frequencies of half an hour or less. The circulator routes also tend to operate primarily on weekdays, though with a longer span of service than express buses, though shorter than local bus routes. Additionally, circulators also tend to operate with at least two or more trips per hour when they are running. The rail system provides service throughout the day and well into the late night with LOS A service levels on the trunk lines present throughout much of the morning, afternoon and early evening.